CLAIMS

1. A digital video recording system comprising:

a camera directed at a scene of interest to view the scene and to continuously generate a plurality of video images thereof;

an image processor configured to compare the video images generated by said camera with a previously established reference image of said scene to determine if any changes have occurred therein;

a memory associated with said image processor, said memory configured to store a plurality of video images; and

wherein said image processor is further configured to access said memory to retrieve said video images produced by said camera, said image processor accessing said memory at any desired memory location representing a time of interest so as not to have to sequentially scan a plurality of video images to locate a video image of interest, and said image processor configured to access said memory without interrupting said processing of currently acquired video images.

2. The system of claim 1 wherein said camera is an analog video camera.

3. The system of claim 2 further including a frame grabber configured to receive said video images from said camera and to generate a digital signal representation of said video images.

4. The system of claim 1 wherein said camera is a digital video camera.

5. The system of claim 1 wherein each of said plurality of video images comprises a plurality of pixel elements and said image processor is configured to

process blocks of said pixels and to compare each of said blocks against a corresponding block from said previously established reference image.

6. The system of claim 5 wherein said image processor is configured to identify which of said blocks in said video images have changed relative to the corresponding block in said previously established reference image.

7. The system of claim 6 wherein said image processor is configured to store said reference image and said identified changed blocks in said memory.

8. The system of claim 7 wherein said image processor is configured to store the location in said image of said identified changed blocks in said memory.

9. The system of claim 7 wherein said image processor is configured to compress said reference image and said identified changed blocks prior to storage.

10. The system of claim 5 wherein said image processor is configured to store those block of said video image which differ from a corresponding block of said reference image, said image processor configured to apply a compression algorithm to each of said blocks prior to storage to maximize the storage capability of said memory.

11. The system of claim 1 wherein said image processor is configured to update said previously established reference image of the scene against which said digital signals are compared.

12. The system of claim 1 wherein said image processor is configured to store said video images in said memory subsequent to a determination of a change from said reference image.

13. The system of Claim 12 wherein said image processor is further configured to store a time and date stamp with said video images.

14. The system of Claim 12 wherein said image processor is further configured to store authentication data with said video images.

15. The system of claim 1 wherein said image processor is configured to retrieve said video images at a second frame rate different from a first frame rate at which said video images were captured by said camera.

16. The system of claim 1 wherein said image processor is remote from said memory and said system includes a transmission means for communicating video images between said memory and said image processor.

17. The system of claim 1 further including an event identifier, said event identifier providing event identification data to said image processor, said image processor configured to associated said event identification data with said video images generated by said camera.

18. A method for updating a reference image stored in the memory of a digital video recording system with a current reference image, comprising:

establishing said stored reference image as said current reference image;

capturing a video image;

counting the number of individual segments in said captured video image;

counting the number of changed segments in said captured video image;

counting the number of stored segments from previously captured video images associated with said previous reference image;

identifying an age of said stored reference image;

if said identified age is greater than a first amount, then establishing said captured video image as said current reference image;

if said count of stored segments is greater than a first predetermined multiple of said count of individual segments, then establishing said captured video image as said current reference image;

if said identified age is greater than a second amount, but less than said first amount, and if said count of changed segments is less than six, establishing said captured video image as said current reference image;

if said count of stored segments is greater than a second predetermined multiple of said count of individual segments, and if said count of changed segments is less than six, establishing said captured video image as said current reference image;

updating said stored reference image with said current reference image.

19. The method of claim 18 wherein said amount is 15 minutes.

20. The method of claim 18 wherein said second amount is 10 minutes.

21. The method of claim 18 wherein said first predetermined multiple is 40.

22. The method of claim 18 wherein said second predetermined multiple is 20.

23. The method of claim 18 wherein the step of identifying the age of said stored reference image includes the extraction of stored time data associated with said stored reference image.

24. A digital video recording system comprising:

a plurality of cameras directed towards at least one scene of interest to view said at least one scene and to continuously generate a plurality of video images thereof;

an image processor configured to compare said plurality of video images generated by said cameras with a plurality of previously established reference images of said at least one scene to identify any regions of change therein;

a memory associated with said image processor, said memory configured to store a plurality of images; and

wherein said image processor is further configured to access said memory to retrieve at least one video image of interest produced by said cameras, said image processor accessing said memory at any desired memory location representing a time of interest so as not to have to sequentially scan a plurality of video images to locate said video image of interest, and said image processor configured to access said memory without interrupting said processing of currently acquired video images.

25. The system of claim 24 wherein said image processor is further configured to access said memory to retrieve a plurality of video images of interest produced by said cameras.

26. The system of claim 24 wherein said image processor is configured to generate a combined video image from said plurality of video images generated by said cameras and to compare said combined video image with a combined reference image composed of a plurality of reference images of said at least one scene.

27. The system of claim 24 wherein said image processor is configured to store any identified regions of change in said memory.

28. A method of recording video images and storing and retrieving the same comprising:

viewing a scene of interest with a camera and generating video images thereof;

converting each frame of video imagery produced by said camera to a digital signal;

processing said digital signal, said processing including

comparing the video image represented by a digital signal with a previously established reference of the scene to determine if any changes have occurred therein, and storing the contents of said digital signals in a memory with date and time data appended to each stored video image represented by a digital signal; and,

accessing said memory to retrieve the contents of said digital signals to recreate the video images produced by said camera, said memory being accessed to retrieve said video images simultaneously with digital signals being stored therein, and said memory being accessed at any desired location representing a time of interest whereby video images stored in said memory do not to be sequentially scanned to locate a video image of interest.

29. The method of claim 28 wherein said video images are acquired from said camera at one frame rate and from said memory at a second predetermined frame rate.

30. The method of claim 28 further including accessing said memory from a location remote therefrom.

31. The method of claim 28 further including authenticating stored video images.

32. The method of claim 28 further including a plurality of cameras each of which is directed at a respective scene of interest, and the method further includes each camera continuously viewing each respective scene and generating video images thereof at a predetermined frame rate, converting each frame of video image from each camera to a signal, processing each digital signal and storing the processed video images in the memory.

33. The method of claim 28 wherein said image processor is configured to update the reference image against which said digital signals are compared.

34. A digital video recording system comprising:

a camera directed at a scene of interest to view the scene and to continuously generate a plurality of video images thereof;

an image processor configured to compare the video images generated by said camera with a previously established reference image of said scene to identify the occurrence of a change in said scene;

a memory associated with said image processor, said memory configured to store video image data; and

wherein said image processor is further configured to select and store said previously established reference video image in said memory, and wherein said image

processor is further configured to store, in said memory, video image data representative of identified changes in said scene.

35. The system of claim 34 wherein each of said video images is composed of a plurality of pixels, and wherein said video image data representative of identified changes in said scene includes at least one changed block of pixels from a video image together with a reference image associated block map.

36. The system of claim 35 wherein said reference image associated block map consists of at least one binary representation of a corresponding pixel block comprising a video image, a first binary representation indicating an unchanged pixel block, and a second binary representation indicating a changed pixel block.

37. The system of claim 36 wherein a position of said binary representation of said corresponding pixel block in said reference image associated block map indicates the position of said pixel block in said video image.

38. The system of claim 34 wherein said video image data representative of identified changes is compressed prior to storage in said memory.

39. The system of claim 34 wherein said video image data representative of identified changes includes transaction identification information.

40. The system of claim 34 wherein said image processor is further configured to reconstruct a video image of a changed scene by extracting said previously established reference video image together with said video image data representative of said identified changes in said scene from said memory.